

VEGETATION AND FLORA OF AMBROSE FEN  
FLATHEAD COUNTY, MONTANA

Prepared for  
The Nature Conservancy  
32 South Ewing  
Helena, MT 59601

Prepared by  
Peter Lesica  
929 Locust  
Missoula, MT 59802

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**Introduction** Ambrose Fen occurs between Rose Creek and Highway 35, ca. 5 miles south of Creston in Flathead County (T28N R20W S27 E1/2, Fig. 1). It is 100-200 acres of fen and carr bounded on the northeast and west by spruce swamp forest. The presence of shallow pools and deep sink holes suggests that the peatlands are formed around and above springs. The source of water for these springs is likely the glacially formed uplands and kettle lakes immediately to the east. Most of the surrounding bottom land is used for agriculture or livestock grazing.

**Ecological significance** Ambrose Fen is one of the largest fen-carr complexes west of the Continental Divide in Montana. It supports six plant associations, including *Picea/Lysichitum americanum* swamp forest which is considered imperiled because of rarity in Montana and globally. The peatlands are very rich in species with many species of plants restricted to boreal mires throughout their range. Six species listed as vascular plant species of special concern by the Montana Natural Heritage Program occur in the peatlands: *Carex livida*, *C. paupercula*, *Cypripedium calceolus*, *Eleocharis rostellata*, *Scirpus cespitosus*, and *Utricularia intermedia*. A seventh species, *Viola renifolia*, is found in the adjacent swamp forest. The size and diversity of this peatland complex as well as the number of rare plants indicate that the Ambrose Fen is a biologically significant wetland feature in the Flathead Valley.

**Ecological composition** Wetlands on the Ambrose property can be classified into three types: (1) swamp forest, (2) carr, and (3) dwarf carr.

#### Swamp forest

***Picea/Equisetum arvense* plant association.** Forests are dominated by spruce (*Picea engelmannii* X *glauca*) and paper birch (*Betula papyrifera*). Bog birch (*Betula glandulosa*) is locally common in the understory. Common ground layer species include *Rubus pubescens*, *Equisetum arvense*, and *Mitella nuda*. Examples of this type on the northeast side of the peatland have more open canopies and have been heavily impacted by livestock grazing and clearing for agriculture. The forest on the west side of the peatland is more protected from grazing and has suffered less disturbance. This association has been described for Montana by Pfister et al. (1977). G4-S4.

***Picea/Lysichitum americanum* plant association.** A large area of swamp forest below the big spring at the west end of the wetlands has an understory dominated by *Lysichitum americanum*, *Equisetum arvense* and *Athyrium filix-femina*. This association is prevalent in the lowest areas around the spring and along water courses. It has been described by Hansen et al. (1995) and Pfister et al. (1977). G2-S2.

#### Carr

***Betula glandulosa/Carex aquatilis* plant association.** Throughout the peatlands are dense stands of *Betula glandulosa* (bog birch) up to 2.5 m high. Other shrubs are uncommon. Common graminoids include *Eleocharis rostellata*, *Carex interior*, *C. diandra*, and *C. aquatilis*. The relatively high productivity of these stands may indicate an association with areas of improved aeration, perhaps caused by upwelling or more rapid drainage. Hansen et al. (1995) describe the *Betula glandulosa/Carex rostrata* habitat type; however, the ground layer at Ambrose Fen is notably different than the one they describe. This plant association has not been described or ranked by the Montana Natural Heritage Program.

***Betula glandulosa/Juncus balticus* plant association.** This carr community is also dominated by *Betula glandulosa*, but it is generally of lower stature, 1.5-2 m high. *Salix candida* (hoary willow) is also common but is usually no more than 1 m high. Dominant ground layer species include *Juncus balticus*, *Carex lasiocarpa*, and *Menyanthes trifoliata*. This association is probably associated with less well-aerated peat than the previous type. Similar vegetation has been described for Pine Butte Fen (Lesica 1986). The *Salix candida/Carex rostrata* habitat type described by Hansen et al. (1995) has a ground layer dominated by coarse sedges rather than the more anaerobic-tolerant species observed in Ambrose Fen. This plant association has not been described or ranked by the Montana Natural Heritage Program.

#### Fen (dwarf carr)

***Betula glandulosa/Carex aquatilis* plant association.** This open dwarf carr or fen community has a low to moderate cover of the shrubs *Betula glandulosa*, *Potentilla fruticosa* and *Salix candida*, 0.5-1.5 m high. The ground layer is dominated by *Eleocharis*

*rostellata*, *Carex buxbaumii*, *C. interior* and *C. aquatilis*. Similar vegetation has been described by Lesica (1986) for Pine Butte Fen, although the dominant sedge was *C. simulata*. This dwarf carr vegetation shares many dominants with the carr vegetation described above; however, *Potentilla fruticosa* and *Eleocharis rostellata* are common in the dwarf carr and uncommon or absent in the carr. This plant association has not been described or ranked by the Montana Natural Heritage Program.

***Betula glandulosa*/*Scirpus acutus* plant association.** *Betula glandulosa*, *Potentilla fruticosa* and *Salix candida* are still common, but this association has the poorest representation of shrubs; most are less than 1 m high. Dominant graminoids are *Scirpus acutus*, *Scirpus cespitosus* and *Carex flava*. Similar vegetation has been described by Lesica (1986) for Pine Butte Fen. This plant association has not been described or ranked by the Montana Natural Heritage Program.

Six species of vascular plants listed as species of concern are known to occur in the Ambrose Fen, and an additional species occurs in the adjacent spruce forest. Five of these rare plants are circumboreal or nearly so in distribution. The remaining two species are widespread in North America. Four of the species are confined to peatlands throughout their range. *Carex lacustris*, another species of concern, may occur in openings in carr vegetation on the south side of the fen; however, all specimens observed were in vegetative condition so positive identification was not possible.

*Carex livida* (pale sedge) is a circumboreal species of peatlands. In North America it is found south to California, Wyoming, Michigan and New York. It is known in Montana from fewer than 20 sites in Flathead, Glacier, Lewis and Clark, Lincoln, Missoula, and Teton counties. It occurs in poorly aerated organic soils of fens at lower elevations. It is distributed throughout the fen communities at Ambrose Fen. G5-S2

*Carex paupercula* (poor sedge) is a circumboreal species, occurring in North America south to Washington, Utah and Colorado. In Montana it is known from fewer than 20 sites in Flathead, Lake and Missoula counties. It occurs in poorly aerated organic soils of fens at lower elevations. It is

reported to occur around the large spring at the west end of the fen at Ambrose Fen. G5-S2

*Cypripedium calceolus* (yellow lady's-slipper) is found throughout much of North America and parts of northern Europe. In Montana it is known ca. 20 sites in the western half of the state. It occurs in moist or wet soil in or along the margins of peatlands and wet meadows at low elevations. It occurs around the large spring at the west end of the fen at Ambrose Fen. G5Q-S2/3

*Eleocharis rostellata* (beaked spike-rush) occurs in southern Canada, most of the U.S. as well as the Caribbean and western South America. In Montana it is known from fewer than 20 sites in Big Horn, Flathead, Lake, Madison, Meagher, Park, Sanders and Teton counties. It occurs in wet calcareous soils, often associated with warm springs at low elevations. It is distributed throughout the fen communities at Ambrose Fen. G5-S2

*Scirpus cespitosus* (tufted clubrush) is a circumboreal species found south in western North America to Oregon, Utah and Montana. In Montana it is known from fewer than 20 stations in Beaverhead, Flathead, Powell and Teton counties. It occurs in wet organic soil at low to high elevations. It is distributed throughout the fen communities at Ambrose Fen G5-S2

*Utricularia intermedia* (flat-leaved bladderwort) is a circumboreal species occurring south in North America to California, Montana, Iowa, and Delaware. In Montana it is known from five sites in Flathead, Lincoln, Missoula, and Powell counties. It occurs in shallow water of peatlands at low elevations. A small colony of this plant was found in shallow depressions at the northeast end of the fen. G5-S1

*Viola renifolia* (kidney-leaved violet) is found from British Columbia to the eastern U.S. and south in western U.S. to Colorado. In Montana this plant is known from fewer than 20 sites in Flathead, Glacier, Jefferson, Lake, Missoula, Silver Bow, and Teton counties. It is found in moist soil, often associated with openings in swamp forest at low to mid-elevations. This species occurs in spruce forest on the west side of the fen. G5-S2

**Management considerations** The area is currently being grazed by cattle, apparently throughout the growing season. This practice may alter the microtopographic structure of the mire and could facilitate the spread of weeds such as *Cirsium arvense* and the introduction of *Sonchus* spp. Use of the area by livestock, especially during the spring and summer, should be curtailed.

Reed canarygrass (*Phalaris arundinacea*) is present in Ambrose Fen. Although there is no evidence that this species is spreading at this site, it formed monocultures in some peatland areas of the nearby Swan River Oxbow Preserve, severely degrading the fen plant community. The presence of reed canarygrass should be monitored to determine if it is increasing under present management conditions.

The ecological integrity and biological values of Ambrose Fen depend on the local hydrologic regime. The source of the water for the peatlands should be determined and protected. It is not known how the current plans to widen the adjacent Highway 35 will affect the local hydrology.

#### Literature Cited

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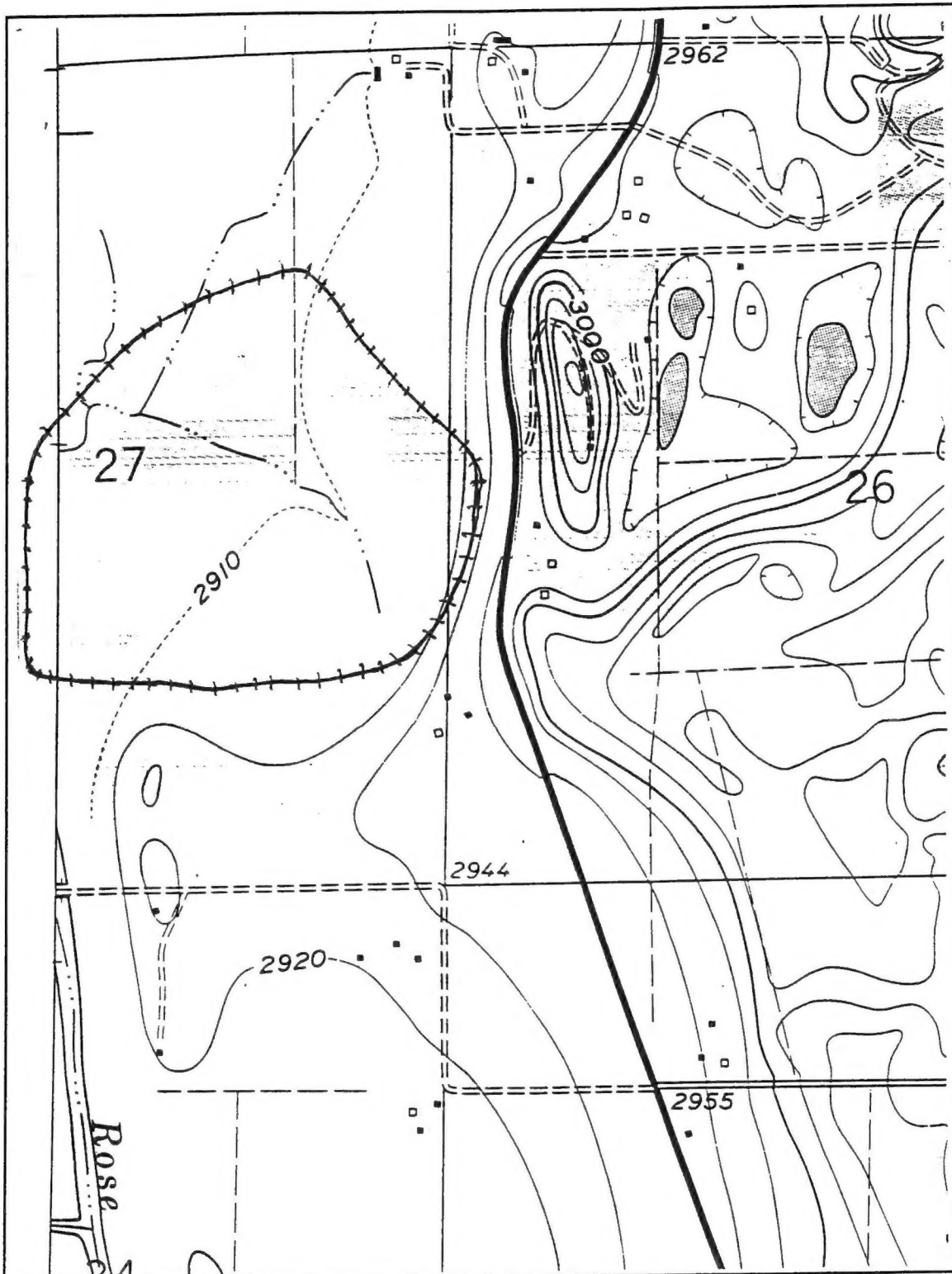


Figure 1. Location of Ambrose Fen in Flathead Valley

Appendix A. Vascular plants observed in Ambrose fen-carr complex and adjacent forests on 16 September 1994 and 27 June 1995. An asterisk (\*) indicates introduced species. An "&" indicates a species reported by Maria Mantas. Nomenclature follows Hitchcock and Cronquist (1973).

ACERACEAE

*Acer glabrum*

APIACEAE

*Angelica arguta*  
*Cicuta douglasii*  
*Heracleum lanatum* &  
*Osmorhiza chilensis*  
*Sanicula marilandica*

ARACEAE

*Lysiclitum americanum*

ARALIACEAE

*Aralia nudicaulis*

ASTERACEAE

*Aster junciformis*  
*Aster occidentalis*  
*Cirsium arvense*\*  
*Cirsium vulgare*\*  
*Erigeron lonchophyllus*  
*Petasites sagittatus*  
*Senecio pseud aureus*  
*Taraxacum officinale*\*

BALSAMINACEAE

*Impatiens aurella*

BETULACEAE

*Alnus incana*  
*Betula glandulosa*  
*Betula occidentalis*  
*Betula papyrifera*

BORAGINACEAE

*Cynoglossum officinale*\*&

*Myosotis laxa*

BRASSICACEAE

*Cardamine pensylvanica*

CAMPANULACEAE

*Lobelia kalmii*

CAPRIFOLIACEAE

*Linnaea borealis*  
*Symphoricarpos albus*

CARYOPHYLLACEAE

*Stellaria longipes*  
*Stellaria media*\*

CORNACEAE

*Cornus canadensis*  
*Cornus stolonifera*

CYPERACEAE

*Carex aquatilis*  
*Carex aurea*  
*Carex buxbaumii*  
*Carex capillaris*  
*Carex concina*  
*Carex diandra*  
*Carex dioica*  
*Carex disperma*  
*Carex flava*  
*Carex interior*  
*Carex lacustris*(?)  
*Carex lasiocarpa*  
*Carex leptalea*  
*Carex limosa*  
*Carex livida*  
*Carex paupercula* &



Carex stipata  
Carex utriculata  
Carex vesicaria &  
Eleocharis palustris  
**Eleocharis rostellata**  
Eleocharis tenuis  
Eriophorum viridicarinatum  
Scirpus acutus  
**Scirpus caespitosus**  
Scirpus microcarpus

DROSERACEAE  
Drosera rotundifolia

EQUISITACEAE  
Equisetum arvense  
Equisetum fluviatile

ERICACEAE  
Pyrola asarifolia

GROSSULARIACEAE  
Ribes setosum

JUNCACEAE  
Juncus balticus  
**Juncus covillei (?)**  
Juncus ensifolius  
Juncus longistylis  
Juncus nodosus

JUNCAGINACEAE  
Triglochin maritima  
Triglochin palustre

LAMIACEAE  
Lycopus uniflorus  
Mentha arvensis  
Prunella vulgaris

LEMNACEAE  
Lemna minor

LENTIBULARIACEAE  
**Utricularia intermedia**  
Utricularia minor

LILIACEAE  
Smilacina stellata  
Zigadenus elegans

LYTHRACEAE  
Lysimachia thyrsiflora

MENYANTHACEAE  
Menyanthes trifoliata

ONAGRACEAE  
Circaea alpina  
Epilobium palustre  
Epilobium watsonii

OPHIOGLOSSACEAE  
Botrychium virginianum

ORCHIDACEAE  
**Cypripedium calceolus**  
Habenaria dilatata  
Habenaria hyperborea  
Habenaria obtusata &

PINACEAE  
Picea sp.

POACEAE  
Agrostis alba  
Bromus ciliatus  
Calamagrostis inexpansa  
Calamagrostis neglecta  
Deschampsia cespitosa  
Glyceria grandis  
Glyceria striata  
Muhlenbergia glomerata  
Oryzopsis aspera  
Phalaris arundinacea\*  
Poa palustris\*

Trisetum canescens

POLYGONACEAE

Polygonum amphibium

Rumex occidentalis

POLYPODIACEAE

Athyrium filix-femina

PRIMULACEAE

Dodecatheon pulchellum

Lysimachia thyrsiflora

RANUNCULACEAE

Ranunculus uncinatus

Ranunculus sceleratus

RHAMNACEAE

Rhamnus alnifolia

ROSACEAE

Amelanchier alnifolia

Fragaria virginiana &

Geum macrophyllum

Geum rivale

Potentilla fruticosa

Potentilla palustris

Rosa acicularis

Rubus idaeus

Rubus pubescens

RUBIACEAE

Galium aparine

Galium boreale

Galium trifidum

Galium triflorum

SALICACEAE

Populus tremuloides &

Populus trichocarpa &

Salix bebbiana

Salix candida

SAXIFRAGACEAE

Mitella nuda

SCROPHULARIACEAE

Mimulus guttatus

Veronica americana

SOLANACEAE

Solanum dulcamara\*

TYPHACEAE

Typha latifolia

VALERIANACEAE

Valeriana edule

VIOLACEAE

Viola canadensis

Viola nephrophylla

**Viola renifolia**